REMARKS

Following entry of the above listing of claims, claims 1-7, 9-12, 15-17, 19, 21-22, 24, 39-43, 46-47 and 52-60 will be pending in this case. The claims which are canceled in the present amendment, are canceled without prejudice to filing a continuation case.

35 USC §112 Rejection

The Office Action rejects claims 1-60 under 35 USC §112, second paragraph as being indefinite, and confusing for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Office Action, p. 2.

In connection with the §112 rejection the Office Action repeatedly notes that the claims are not clear as to whether the load and capacitor are in series or in parallel. All of the pending independent claims herein have been amended to clarify this issue. Further, it is submitted that the additional aspects of the §112 rejections are also addressed by the above amendments.

35 USC §102 Rejection

The Office Action rejected claims 1, 16, 21, 25, 37, 38, 46 and 52 under 35 USC §102b as being unpatentable over Sato et al (US 5,181,217). The Office Action states that Sato discloses as laser where there is a gas discharge between a pair of electrodes, and "having a capacitance for storing a charge and a load or resistor configured to dissipate energy as a result of a discharge in the gas discharge area . . ." Office Action, p. 5. In support of this statement the Office Action cites elements 11, 13 and 6 shown in Fig. 1 of Sato. A review of Fig. 1 shows that elements 11, 13 and 6 are not loads which would operate as recited by the claim in that they are inductors and capacitors which would not operate to dissipate energy. Further, the load of claim 1 is recited as being in series with the capacitor which stores a charge from the high voltage pulsed generator and applies it to the first electrode, and the load is disposed between this capacitor and the first electrode. This aspect of the claim also does not appear to be present in Fig. 1 or Sato.

Further in support of the rejection of claim 1, the Office Action also refers to elements 35 and 36 of Fig. 17 of Sato. Element 35 of Fig. 17 appears to actually be a sustainer capacitor. See, Sato 21:15-20. Further, this element 35 does not appear to be in series between an electrode and the capacitor as recited by claim 1. The element 36 also does not appear to be a load to

dissipate power resulting from a discharge. Rather element 36 appears to be magnetic isolator, or a switch which appears to relate to the timing a pulse being applied to an electrode. See e.g. Sato 19:49-61 and 20:33-55.

Further in support of the rejection of claim 1 the Office Action refers to elements 6, 9, 14 and 15 of Fig. 27. It is respectfully submitted that consideration of Fig. 27 and the discussion of Fig. 27 in Sato actually highlights the fact that apparatus recited in claim 1 is different than the apparatus shown in Sato. First, it appears the element 6 of Fig. 27 is actually the capacitor which receives an electrical charge from a pulse circuit. Element 9 is a capacitor which appears to be a pulse charge capacitor which applies a voltage to the capacitor which is element 6. Significantly, there is clearly shown in Fig. 27 to be no load in series with the capacitor (element 6) and the electrodes. It appears that elements 16, 17, and 18 of Fig. 27 correspond to the discharge area between the electrodes. Specifically as shown in Sato at 3:1-16, it appears that elements 16, 17, and 18 represents different aspects of the discharge area which is shown as element 5 in some of the figures of Sato. Thus, these elements are not actually separate elements rather they represent the discharge area. Thus none of these elements would correspond to a load as recited in claim 1, where the load is between the electrode and the capacitor, and in series with the capacitor.

Fig 1
Fig 27

Elements 14 and 15 of Fig. 27 are noted as not being in series between the capacitor 6 and an electrode, and further element 14 is an inductor and as such would not operate as a load to dissipate energy as by claim 1. Further, resistor 15 does not operate as recited by claim 1, indeed resistor 15 of Fig. 27 is provide to merely illustrate that the line connecting different elements of the system may have some resistance. In fact the resistor 15 is specifically designated as the "line resistance" (Sato 3:5-6), and further, the line resistance is so small that it is ignored in terms of calculating the systems performance (Sato 3:46-49). Thus, it is respectively submitted that Sato clearly does not anticipate or suggest an apparatus as recited by claim 1. Claims 2-7, 9-12 and 15 depend from claim 1 and are respectfully submitted to be patentable of Sato for at least the same reasons as claim 1.

It is noted that the analysis provide in connection claims 16, 21, 39 46, and 52 relied on the same analysis discussed above in connection with claim 1. With regard to claims 16, 21 and 39 is noted that in significant part these claims contain language similar to claim 1. Claim 16 recites a peaking capacitor in series with a resistor, and that the resistor is disposed between the

peaking capacitor and the electrode, and further that the resistor operates to dissipate energy as a result of a discharge in the gas discharge region. It is respectfully submitted that this is not disclosed in Sato.

Claim 21 recites two peaking capacitors. Further a second peaking capacitor is in series with a resistor. The structure recited by claim 21 appears to clearly not be disclosed by Sato.

Claim 39 also recites aspects of a structure which is similar to claims 1, 16, and 21 and adds additional details. It is respectfully submitted that the structure of claim 39 is not disclosed in Sato.

Claim 46 is a method claim recites in part

> storing the electrical charge in the peaking capacitance, and then transmitting the electrical charge from the peaking capacitance to the discharge electrodes, whereby the electrical charge is discharged between the discharge electrodes;
>
> providing a load coupled between a first electrode of the discharge electrodes, and the peaking capacitance;
>
> dissipating an ~~the~~ energy of ~~the~~ an electrical pulse resulting from the transmitting of the electrical charge to ~~through~~ the discharge electrodes in ~~and an~~ the ~~additional~~ load coupled between the peaking capacitance and the first electrode of the discharge electrodes,
>
> wherein the dissipation through the additional load stabilizes the current through the discharge electrodes.

As shown by the above language from claim 46, this claim recites a method which provides a load in series with the peaking capacitance, and this load operates to dissipate energy resulting from the transmission of an electrical charge to the discharge electrodes, whereby the dissipation operates to stabilize the current. Sato does not appear to disclose a load connected in series with the peaking capacitance, and using the load to stabilize the current through the discharge electrodes. Indeed, Sato does not appear to provide any teaching which suggests that it would be beneficial to provide a load in series with the peaking capacitance. Thus it is respectfully submitted that claim 46 is patentable over Sato. Further, claim 47 depends from claim 46 and is submitted to be patentable over Sato for at least the same reasons as claim 46. through the discharge electrodes.

Claim 52 recites in part a capacitor and a load in series, and a pulse compression circuit coupled to the capacitor. The load is disposed between a first electrode and the capacitor. Further, the load operates to dissipate streamers generated by a glow discharge. It is respectfully,

submitted that this structure is not shown in or suggested by Sato. Further, claims 53-60 depend from claim 52 and are respectfully submitted to be distinguishable over Sato for at least the same reasons as claim 52.

35 USC §103 Rejection

In addition to the rejection of the independent claims under §102 in view of Sato, the Office Action goes on to reject all of the claims under §103 as being unpatentable over Myers (US 6,128,323) in view of Sato. As discussed in detail above, it is respectfully submitted that Sato does not disclose the concept of using a load between the peaking capacitance and the discharge electrode to dissipate energy.

Further a review of the Fig. 8b of Myers which is referred to in the Office Action in support of the rejection under §103, similarly does not disclose a load in series with a peaking capacitance, where the load is between the peaking capacitance and a first electrode of a pair of discharge electrodes. Specifically, it appears that the configuration of the diode, resistor and Lp shown in Fig. 8B of Myers is configured such it is not for dissipating energy as a result of discharge in the gas discharge area. Indeed, it appears that Myers does not provide any clear identification number for, or discussion of, the resistor and diode shown Fig. 8B (the resistor and diode shown as being in parallel with the capacitor Cp). Based on the discussion provided in Myers at col. 13:5-21, regarding a resistor, it appears that the resistor referred to in the Office Action is used in connection with providing a biasing current. Further, the fact that the diode is positioned between resistor and the electrode 83 suggests that the resistor would not be such that discharge from the electrode 83, back through the inductor Lp, would be transmitted through the resistor which is in series with the diode. Thus, the resistor does not appear to be for dissipating energy transmitted through it as a result of a discharge in the gas discharge area as recited by claims. Further, it is noted that the resistor is not shown as being in series with a peaking capacitance. Thus, it is respectfully submitted that a combination of Sato and Myers would not result in an apparatus or method which provides for a load in series with a peaking capacitance as recited by the claims.

Claims 5-7, 17, 22, 53, 58-60

Claims 5-7, 17, 22, 53, 58-60 are all dependent claims which recite providing some cooling of the load, where the load is identified in the corresponding base independent claims as being an element which is used to dissipate energy resulting from a discharge through the discharge electrodes. Each of these claims which includes some element of cooling depends from an independent claim which is believed to be patentable for the reasons discussed above. In addition each of these cooling claims appears to recite additional elements which are clearly not disclosed or suggested by Myers.

In rejecting these claims these claims the cooling claims, the Office Action states in part:

> With respect to claims 5,6,7, 17, 22, 29, 30, 53,58, 59 and 60 Myers '323 shows in figure 8a (LASER CHAMBER: gas circulation fan) shows a cooling unit cooling the laser chamber or the load comprising the resistor, capacitor and electrodes and an encapsulated volume with circulating oil (Col 3:20-25, Col. 15:10-15). Rearranging parts of an invention involves only routine skill in the art.

It is noted that that gas circulation fan referred to in the Office Action in connection with figure 8a, clearly appears to be a fan which is used to circulate gas in inside a chamber which contains the discharge electrodes. Specifically, as shown in Fig. 8a of Myers a dashed line surrounds the electrodes 83 and 84 and the unnumbered element identified as 'gas circulation fan'. The capacitor 82 is clearly shown as being outside of the dashed line which contains the electrodes and the fan. Further, as is known in the art, one would not put unnecessary components inside the gas discharge area, for it would likely introduce contaminating elements inside the gas discharge area. In fact, the Myers reference appears to specifically address the fact that the Capacitor Cp is located on top of the gas discharge area rather than inside it. For example, see Myers col. 15:66-16:1, stating: "The Cp capacitor is comprised of a bank of twenty-eight 0.59 nf capacitors mounted on top of the laser chamber pressure vessel." Further, this discussion suggests not only that the resistor and capacitor are not inside the gas discharge area, it also appears to show that these components are on the pressure vessel, rather than being inside the encapsulated volume with circulation oil, referred to in the Office Action. Indeed, there appears to be no discussion in Myers which suggests that the Capacitor CP, diode and resistor should be cooled. Thus, it is respectfully submitted that claim 5 is patentable over Myers for this reason as well. Thus, it is respectfully submitted that Myers does not disclose or suggest cooling a load which is used to dissipate energy resulting from a discharge in the electrodes as recited by the claims above.

It is recognized that the Office Action has taken the position that it would have been obvious to combine somehow combine elements of Myers to arrive at the cooling of the load as recited in load cooling claims. However, this position is based on a first assumption that it would have been obvious to provide an additional load positioned between the capacitor and a discharge electrode to dissipate energy, and that it would have been advantageous to dissipate a significant amount energy such that the load would generate sufficient heat that it would need to cooled. This position from the Office Action appears to fail on at least two points. First neither Sato or Myers appear to provide any teaching which suggest a capacitor and a load in series where the load operates to dissipate energy. Second, neither Sato of Myers appear to teach the advantage of dissipating a sufficient amount of energy, such that the load would generate a sufficient amount of heat that it should be cooled.

Claims 55 and 56

Claims 55, 56 and 57 were rejected on the grounds that discovering an "optimum or workable ranges involves only routine skill in the art." It is respectfully submitted that Myers and Sato do not appear to discuss or suggest any recognition of the problem which is being addressed by the load in claims 55-57. Further, Myers and Sato do not appear to provide any teaching which suggests putting a load between the capacitance, which receives an electrical charge from a pulse compression generator, and then applies the received electrical charge to the electrodes. Thus, given that Myers and Sato do not suggest such a load, it would not have been obvious to then use routine skill in the determine a value for the resistance as recited by claims 55 and 56. Thus, for these reasons it submitted that these claims are patentable for this additional reason.

Response to Examiner's Response to April 1, 2003 Arguments

The Office Action provides a response to the April 1, 2003 response, which states in part:

> The load or resistor "configured to dissipate energy transmitted through it as a result of a discharge in the gas discharge area" is nothing more than a resistor use to control amount of current or power into the discharge circuit. As the discharge circuit fire, an amount of current will travel through the resistor and/or load – which dissipate energy as a result of a discharge in the gas discharge area. (Ex: current pass through resistor will generate a potential and heat)

It is respectfully submitted that neither Sato or Myers disclose a system or method where an electrical charge is received from a pulse generator, and stored in a capacitance, where this capacitor then applies the charge to the discharge electrodes, and a load or resistor is in series with the capacitance, and the load operates to dissipate energy resulting from the discharge in the electrodes. This operation and positioning of the load or resistor is believed to be novel, and does not appear to be present in either Sato or Myers references. Accordingly, it is respectfully submitted that all of the pending claims are patentable and are now in condition for allowance.

CONCLUSION

For the reasons set forth above, it is believed that all claims now present in this application are patentably distinguishable over the references. Therefore, reconsideration is requested, and it is requested that this application be passed to allowance.

Respectfully submitted,

STALLMAN & POLLOCK LLP

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By: _____
Brian J. Keating
Reg. No. 39,520

Attorneys for Applicant(s)